

EL 844053012

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Priority Application Serial No. 09/480,076

Priority Filing Date January 10, 2000

Inventor Rickie C. Lake

Assignee Micron Technology, Inc.

Priority Group Art Unit 1733

Priority Examiner J. Haran

Attorney's Docket No. MI40-338

Title: A Battery Powerable Apparatus, Radio Frequency Communication Device, and Electric Circuit (As Amended)

Preliminary Amendment to Accompany the filing of a Divisional Application

To: Box Patent Application
Assistant Commissioner for Patents
Washington, D.C. 20231

From: Bernard Berman (Tel. 509-624-4276; Fax 509-838-3424)
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Sir:

This is a preliminary amendment accompanying a Request for Divisional Application for the above-entitled patent application. Prior to examining the application, please enter the amendments and consider the remarks contained herein

AMENDMENTS

In the Specification

Please amend the title to read as:

--A Battery Powerable Apparatus, Radio Frequency Communication Device, and Electric Circuit--

On page 1, after the title and prior to the "Technical Field", insert:

-- RELATED PATENT DATA

This patent resulted from a divisional application of U.S. Patent Application Serial No. 09/480,076 filed on January 10, 2000, which is a divisional application of U.S. Application Serial No. 09/022,812, filed February 12, 1998.--

Please amend the Abstract of the Disclosure as follows:

-- A curable adhesive composition, comprising an epoxy terminated silane is provided. A thin profile battery and a substrate to which the thin profile battery is to be conductively connected are also provided. The adhesive composition is interposed between the battery and the substrate, and cured into an electrically conductive bond between the battery and the substrate. In another aspect, a curable epoxy composition is interposed between first and second electrically conductive components. The epoxy has an effective metal surface wetting concentration of silane to form a cured electrical interconnection having a resistance through said electrical components of less than or equal to about 0.3 ohm-cm². In another aspect, a battery powerable apparatus, i.e. an Rf communication device, includes a conductive adhesive mass comprising an epoxy terminated silane. Also, the invention includes an

electric circuit comprising first and second electric components electrically connected with one another through a conductive adhesive mass.--

In the Claims

Please replace the claims with the following clean version of the entire set of pending claims, in accordance with 37 C.F.R. §1.121(c)(1)(i). Cancel all previous versions of any pending claim.

A marked up version showing amendments to any claims being changed is provided in one or more accompanying pages separate from this amendment in accordance with 37 C.F.R. §1.121(c)(1)(ii). Any claim not accompanied by a marked up version has not been changed relative to the immediate prior version, except that marked up versions are not being supplied for any added claim or canceled claim.

Cancel claims 9-14 and 23-28 without prejudice.

29. A battery powerable apparatus comprising:

a substrate having a surface comprising at least one node location;
a thin profile battery mounted over the substrate and node location;

and

a conductive adhesive mass electrically interconnecting the thin profile battery with the node location, the conductive adhesive mass comprising an epoxy terminated silane.

30. The apparatus of claim 29 wherein the epoxy terminated silane comprises a glycidoxy methoxy silane.

31. The apparatus of claim 29 wherein the epoxy terminated silane comprises a glycidoxypyropyltrimethoxysilane.

32. The apparatus of claim 29 wherein the epoxy terminated silane is present in the adhesive mass at less than or equal to about 2% by weight.

33. The apparatus of claim 29 wherein the epoxy terminated silane is present in the adhesive mass at less than or equal to about 1% by weight.

34. The apparatus of claim 29 wherein the thin profile battery comprises an outer nickel clad stainless steel surface over which the conductive adhesive mass is received.

35. The apparatus of claim 29 wherein the thin profile battery is a button type battery having a terminal housing member comprising an outer nickel clad stainless steel surface over which the conductive adhesive mass is received.

36. The apparatus of claim 29 wherein the thin profile battery is a button type battery having a terminal housing member comprising an outer nickel clad stainless steel surface over which the conductive adhesive mass is received, and the substrate comprises conductive printed thick film ink over which the conductive adhesive mass is received.

37. A radio frequency communication device comprising:
a substrate having conductive paths including an antenna;
at least one integrated circuit chip mounted to the substrate and in
electrical connection with a first portion of the substrate conductive paths;
and
a thin profile battery conductively bonded with a second portion of the
substrate conductive paths by a conductive adhesive mass, the conductive
adhesive mass comprising an epoxy terminated silane.

38. The device of claim 37 wherein the epoxy terminated silane
comprises a glycidoxy methoxy silane.

39. The device of claim 37 wherein the epoxy terminated silane
comprises a glycidoxypropyltrimethoxysilane.

40. The device of claim 37 wherein the epoxy terminated silane is
present in the adhesive mass at less than or equal to about 2% by weight.

41. The device of claim 37 wherein the epoxy terminated silane is
present in the adhesive mass at less than or equal to about 1% by weight.

42. The device of claim 37 wherein the thin profile battery comprises
an outer nickel clad stainless steel surface over which the conductive
adhesive mass is received.

43. The device of claim 37 wherein the thin profile battery is a button type battery having a terminal housing member comprising an outer nickel clad stainless steel surface over which the conductive adhesive mass is received.

44. The device of claim 37 wherein the thin profile battery is a button type battery having a terminal housing member comprising an outer nickel clad stainless steel surface over which the conductive adhesive mass is received, and the conductive paths comprise conductive printed thick film ink over the second portion of which the conductive adhesive mass is received.

45. An electric circuit comprising first and second electric components electrically connected with one another through a conductive adhesive mass comprising an epoxy terminated silane.

46. (Amended) The apparatus of claim 45 wherein the epoxy terminated silane comprises a glycidoxymethoxy silane.

47. The apparatus of claim 45 wherein the epoxy terminated silane comprises a glycidoxymethyltrimethoxysilane.

48. The apparatus of claim 45 wherein the epoxy terminated silane is present in the adhesive mass at less than or equal to about 2% by weight.

49. The apparatus of claim 45 wherein the epoxy terminated silane is present in the adhesive mass at less than or equal to about 1% by weight.

50. The apparatus of claim 45 wherein at least one of the first and second electric components comprises a nickel containing metal surface over which the conductive adhesive mass is received.

Please add new Claims 51-56 as follows:

51. (New) The apparatus of Claim 29, where the conductive adhesive mass electrically interconnecting the thin profile battery with the node location has an interconnecting resistance of less than or equal to about 0.32 ohm-cm².

52. (New) The apparatus of Claim 29, where the conductive adhesive mass electrically interconnecting the thin profile battery with the node location has an interconnecting resistance of less than or equal to about 0.16 ohm-cm².

53. (New) The apparatus of Claim 37, where the conductive adhesive mass conductively bonding the thin profile battery with the second portion of the substrate conductive paths has an resistance of less than or equal to about 0.32 ohm-cm².

54. (New) The apparatus of Claim 37, where the conductive adhesive mass conductively bonding the thin profile battery with the second portion of the substrate conductive paths has an resistance of less than or equal to about 0.16 ohm-cm^2 .

55. (New) The apparatus of Claim 44, where the conductive adhesive mass electrically connecting the first and second electric components with one another has an electrical resistance of less than or equal to about 0.32 ohm-cm^2 .

56. (New) The apparatus of Claim 44, where the conductive adhesive mass electrically connecting the first and second electric components with one another has an electrical resistance of less than or equal to about 0.16 ohm-cm^2 .

REMARKS

This application is a divisional application of U.S. Patent Application No. 09/487,076 in which claims 9-50 were pending. Claims 9-14 and 23-28 are canceled without prejudice. Claim 46 is amended to bring such claim into accordance with the language of Claims 47-50 and to correct a spelling error. The scope of Claim 46 is not changed by such amendment. Claims 51-56 are added. It follows then that Claims 29-56 are pending in the application and presented herein for examination.

Respectfully submitted,

Dated: Nov 21, 2001

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VERSION WITH MARKINGS TO SHOW CHANGES MADE
ACCOMPANYING A PRELIMINARY AMENDMENT TO ACCOMPANY A
DIVISIONAL FILING

The specification and claims have been amended as follows.

Underlines indicate insertions and ~~strikeouts~~ indicate deletions.

Abstract of the Disclosure

A curable adhesive composition, comprising an epoxy terminated silane is provided, ~~which comprises an epoxy terminated silane~~. A thin profile battery and a substrate to which the thin profile battery is to be conductively connected are also provided. The curable adhesive composition is interposed between the ~~thin profile~~ battery and the substrate. ~~It is and~~ cured into an electrically conductive bond ~~electrically interconnecting between~~ the battery and the substrate. ~~In another aspect, the invention includes a method of conductively interconnecting electronic components using a curable adhesive composition which comprises an epoxy terminated silane.~~ The ~~invention in another aspect includes interposing~~ In another aspect, a curable epoxy composition is interposed between first and second electrically conductive components, ~~to be electrically interconnected~~. At least one of the components ~~comprises a metal surface with which the curable epoxy is to electrically connect~~. The

~~epoxy is cured into an electrically conductive bond electrically interconnecting the first and second components. The epoxy has an effective metal surface wetting concentration of silane to form a cured electrical interconnection having a resistance through said metal surface electrical components of less than or equal to about 0.3 ohm-cm². In another aspect, a battery powerable apparatus, i.e. an Rf communication device, includes a conductive adhesive mass comprising an epoxy terminated silane, ~~between a battery and substrate. A radio frequency communication device is one example. In another aspect~~ Also, the invention includes an electric circuit comprising first and second electric components electrically connected with one another through a conductive adhesive mass comprising an epoxy terminated silane.~~

In the Claims

Cancel Claims 9-14 and 23-28 without prejudice.

46. The ~~electrical circuitry apparatus~~ of claim 45 wherein the epoxy terminated silane comprises a glycidoxy methoxy silane.

Please add new Claims 51-56.